

Title

MiniBooNE(first section of BooNE)

Physics Goals

Investigate the LSND neutrino oscillation signal. If LSND is confirmed this would mean at least four neutrino flavors, i.e. sterile neutrinos and consequently would change the roadmap for future neutrino experiments considerably. Would measure muon neutrino \rightarrow electron neutrino and same for antiparticles. Consequently, can measure CP and CPT violations.

$\Delta m^2 > 0.1 \text{ eV}^2, \sin^2(2\theta) > 0.001$. Covers LSND acceptance.

Features

1 GeV muon-neutrino/anti-neutrino beam, pulsed. 800 ton mineral oil detector.

Second stage (BooNE): second detector at appropriate distance to measure oscillation parameters.

Measure Cerenkov light of muons or electrons produced by neutrino collisions. Use different characteristics of light cone to distinguish between electron and muon. Electrons should produce fuzzy cones due to re-scattering.

Technological Challenges

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LBNL Contribution and Interest

possible participation in BooNE:

R&D, Analysis

Status

Start data taking in summer of 2002.

Timeline

MiniBooNE: 2 years of running

duration: depends on outcome of MiniBooNE; if LSND confirmed then continuation with BooNE

Location

Fermilab

Collaboration

About 60 physicists from 13 (mostly American) institutions

Funding Sources

DOE

Resources, Links, and References

<http://www-boone.fnal.gov/publicpages/index.html>

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